Verification highlights

The Comprehensive Nuclear-Test-Ban Treaty (CTBT) includes a definition of a global verification regime to monitor compliance with the Treaty. Establishing this regime, which must be capable of detecting nuclear explosions underground, in water and in the atmosphere, is the main activity of the Preparatory Commission for the CTBTO. The verification regime must be operational at the Treaty's entry into force. The regime consists of an International Monitoring System (IMS) supported by an International Data Centre (IDC), consultation and clarification, on-site inspections (OSI) and confidence-building measures.

IMS station status

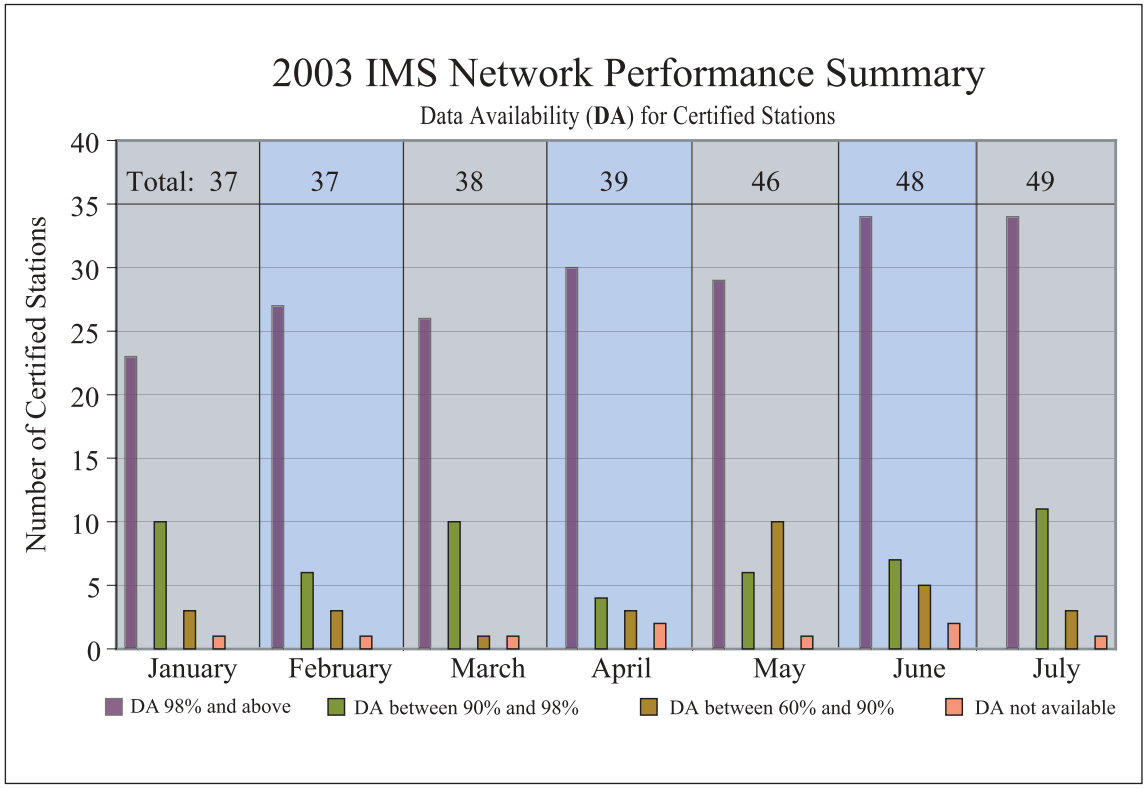
Considerable progress has been made in establishing and certifying IMS stations in the past six months. The number of certified facilities meeting all technical specifications has increased from 57 to 68, including two radionuclide laboratories. Site surveys have been completed for 293 stations out of the 337 IMS facilities. Altogether 90 stations have already been established or substantially meet specifications, and 52 additional stations are under construction or in contract negotiation. Nearly 60 IMS stations are currently funded for operation and maintenance, either for testing and evaluation prior to certification or for post-certification activities. Some 85 facilities are currently sending data to the International Data Centre in Vienna, where the data is processed and released to Member States for final analysis. ■

IMS station operation and maintenance

With approximately 50% of the International Monitoring System network of four verification technologies now constructed, the Provisional Technical Secretariat (PTS) is increasingly focusing on the operation and maintenance (O&M) of the IMS network. O&M will become the dominant part of the IMS programme once the stations are fully established.

An O&M coordination group was created to establish common O&M procedures and to promote a horizontal flow of information within the PTS. It reports to the Director of the IMS Division. The coordination of O&M includes activities such as the development of databases to manage information related to station O&M; coordination of the implementation of the model O&M contracts; the documentation of O&M procedures; the training of station operators and the development of logistical plans for the long-term sustainment of the network. To achieve this, O&M coordination is supported by the technical expertise of the IMS and International Data Centre Divisions, and representatives from the

continued on page 16



THE GRAPH DISPLAYS DATA AVAILABILITY (DA) FOR CERTIFIED STATIONS THAT HAVE STARTED OPERATIONS. DA IS A KEY PERFORMANCE INDICATOR (KPI) THAT REPRESENTS THE AMOUNT OF DATA RECEIVED AT THE INTERNATIONAL DATA CENTRE IN VIENNA. ON THIS GRAPH, DA IS EXPRESSED IN PERCENTAGES PER MONTH DIVIDED IN FOUR GROUPS (98% IS THE TARGET KPI SET BY THE PREPARATORY COMMISSION)

New approaches in GCI: Connecting remote stations to the IDC via private network circuits

Over the past twelve months, the Global Communications Section of the IDC has conducted a series of pilot tests to evaluate the suitability of Virtual Private Network

GLOBAL COMMUNICATIONS INFRASTRUCTURE NETWORK

(VPN) technologies for the transport of IMS data. The challenge was to find a technology that had the same reach as the current satellite-based network and was as competitive in terms of cost and reliability. The Internet has been used as a medium to establish a VPN to the Provisional Technical Secretariat in locations with reliable Internet connectivity and where satellite-based services are unavailable due to either technical or commercial constraints.

Ten VPN connections using the Internet have been deployed so far. Special care has been taken to ensure full integration with the existing Global Communications Infrastructure information systems. The results of the pilot scheme to date have been very promising – in many cases the availability of the VPN services exceeds that of traditional GCI technology. Deployment costs have also been lower. Future plans for VPN services include the integration of other remote office facilities with the Computer Infrastructure section.

Data sent via VPN is encrypted at a very high standard and future security projects are envisaged to enhance the security of VPN services connected to the PTS. Further VPN development is planned over the next twelve months in areas where traditional satellite-based technologies cannot be deployed. ■

Logistics are crucial to the effectiveness of an on-site inspection

Effective logistics are one of the key ingredients for a successful on-site inspection which will clarify whether or not a nuclear test explosion has taken place.

The 2002 On-Site Inspection Field Experiment (FE02) in Kazakhstan involved a number of operational activities such as overflight, passive seismometry, environmental sampling, visual observation, map-making and establishing a base camp. These activities, and the hundreds of 'actionable' lessons that emerged from FE02, would not have been possible without intensive prior logistical preparation.

Among the necessary arrangements was the travel of 27 inspectors from 18 different cities around the world to either the Point of Entry in Almaty, Kazakhstan, or to Vienna and then to Almaty. More than two tonnes of medical, decontamination and inspection

MORE THAN TWO TONNES OF INSPECTION EQUIPMENT WERE SHIPPED FOR FE02

equipment had to be shipped from Vienna to Almaty and shepherded through customs. Two tonnes of potable water and batteries (for portable seismometers) were purchased in Almaty to avoid costly air freight charges. In addition, in-country transportation needed to be arranged, including a 24 hour, 1200 km train and bus trip from Almaty to the remote Base Camp, six hours of helicopter time for overflight, and numerous vehicles to support in-field inspection activities. Accommodation, food service, laundry, etc. were contracted with a nearby coal mining company.

Although FE02 operations were conducted according to the Treaty's stringent timelines, the logistics were prepared in advance. FE02 provided a realistic laboratory in which the Provisional Technical Secretariat (PTS) could test and improve its logistics preparations for an eventual real OSI – when the PTS will have only six days to arrange such crucial services. ■

Seminar on CTBT...

continued from page 3

Yoshio Fukao, a Japanese seismologist, underlined the advantages of linking global and regional networks in the field of seismic tomography, a technique of taking pictures of the earth's interior using seismic waves. Among other examples, he demonstrated the effect of atmospheric and oceanic loading, and seasonal variations thereof, on the earth's free oscillations. "We anticipate a great contribution of the CTBT network to understand the phenomena involving the atmosphere, ocean and solid earth," he said.

Around 150 representatives of States, non-governmental organizations and the media participated in the seminar. ■

Operation and maintenance...

continued from page 12

Evaluation, Procurement, Financial and Legal Services Sections. O&M coordination consists of five functional areas: Operations, Engineering, Planning, Contract Management and Training. Operations is responsible for the development and implementation of common operational procedures, monitoring of station performance and evaluating operational, logistical and maintenance problems. Engineering and Planning develops an integrated network database to store and manage information relevant to IMS and Global Communications Infrastructure (GCI) station configuration management. The Contract Management group is in charge of managing O&M contract implementation and finally, the Training Coordinator defines training programmes and oversees training workshops for station and site operators.

Except for the auxiliary seismic stations, which are operated with national funds, the PTS is expected to pay for the O&M once a station is certified. Operation and maintenance usually starts a few months before the station is certified, under testing and evaluation, to demonstrate that the station is performing well. Certification is therefore an important step for the host country, as a local technical institution will be engaged under contract with the PTS to operate and maintain the station. ■

Calendar of Meetings 2004

Preparatory Commission:

22nd Session	22 - 25 June 2004
23rd Session	15 - 19 November 2004

Working Group A:

25th Session	7 - 11 June 2004
26th Session	4 - 8 October 2004

Working Group B:

22nd Session	9 - 27 February 2004
23rd Session I	24 May - 4 June 2004
23rd Session II	30 August - 10 Sept. 2004

Advisory Group:

22nd Session I	19 - 23 April 2004
22nd Session II	17 - 21 May 2004
23rd Session	13 - 17 September 2004

PUBLISHED BY:

Public Information
Preparatory Commission for the
Comprehensive Nuclear-Test-Ban
Treaty Organization (CTBTO)

Vienna International Centre, P.O. Box 1200
1400 Vienna, Austria

T +43 1 26030 6200
F +43 1 26030 5823
E info@ctbto.org
I www.ctbto.org

CTBTO SPECTRUM - ISSN: 1680-533X

Printed in Austria, December 2003